



A STUDY OF EFFICACY AND SAFETY OF ORAL MINOXIDIL IN MALE ANDROGENETIC ALOPECIA

Dermatology

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ABSTRACT

Background: Androgenetic alopecia is a progressive, patterned hair loss in genetically predisposed individuals due to exaggerated response to androgens, affecting both males and females. **Aim And Objective:** This study evaluates the effectiveness and safety of oral minoxidil in male pattern hair loss, using clinical and photographic assessments, while monitoring for side effects. **Material And Methodology:** 100 males with androgenetic alopecia (Grade III–V) received 5 mg oral minoxidil daily for 24 weeks. Efficacy and side effects were assessed using clinical, photographic, and self-assessment methods. **Results:** The study showed significant hair growth, with a 20.3% increase in hair density by 28 weeks. Side effects included hypertrichosis (12%), oedema, hypotension, and minor skin reactions. **Conclusion:** Oral minoxidil 5 mg daily effectively promotes hair growth in men with AGA. It's affordable and generally safe, though caution is advised in older patients or those with cardiovascular risks.

KEYWORDS

oral minoxidil, male androgenetic alopecia, efficacy, safety

INTRODUCTION

Androgenetic alopecia is the most common form of non-scarring hair loss, affecting 30–50% of men and women after puberty, primarily between ages 30–50 years. It involves progressive miniaturization of hair follicles due to genetic predisposition and hormonal factors, particularly dihydrotestosterone (DHT). This leads to a shortened anagen (growth) phase and prolonged telogen (resting) phase, resulting in reduced hair length (miniaturization) and density. In men, hair loss typically affects the vertex and frontotemporal areas (Norwood-Hamilton scale), while women experience diffuse thinning over the crown (Ludwig scale). Diagnosis is based on clinical history, physical exam, dermoscopy, and supportive lab investigations.

Various medical and surgical treatments exist for androgenetic alopecia, including oral and topical minoxidil, finasteride, dutasteride, and procedures like platelet-rich plasma and hair transplantation. Topical minoxidil and oral finasteride are first-line treatments for men, while topical minoxidil is preferred for women. However, topical minoxidil often causes scalp irritation, odor, and poor compliance due to twice-daily application. Oral minoxidil offers practical advantages: it is easier to use, less messy, more cosmetically acceptable, and often cheaper.

Minoxidil promotes hair regrowth by opening ATP-sensitive potassium channels via its active metabolite, minoxidil sulfate, causing vascular smooth muscle relaxation and creating a negative intracellular potential that reduces calcium levels. This suppresses epidermal growth factor (EGF)-induced inhibition of hair follicle growth, prolonging the anagen phase. It acts as a vasodilator, increasing blood flow and nutrient delivery to follicles. Minoxidil also reduces perifollicular inflammation by suppressing T-lymphocytes and inhibiting prostacyclin and interleukin-1 α . Additionally, it stimulates vascular endothelial growth factor release and activates the Wnt/ β -catenin pathway, crucial for hair follicle regeneration.

Methodology:

The study screened 100 male patients aged 20–50 with androgenetic alopecia (Hamilton Grade III–V). Participants received 5 mg oral minoxidil daily for 24 weeks, with the first dose at night to prevent orthostatic hypotension. Follow-up continued for one month after treatment cessation. Efficacy was assessed at 4, 12, 24, and 28 weeks using hair counts, density, thickness, a 7-point scale (-3 to +3) evaluating four scalp areas, photographic evidence, and self-assessment questionnaires. Side effects were monitored throughout treatment and follow-up phases to evaluate safety.

Inclusion Criteria:

1. **Age:** Male patients aged between 20 to 50 years only were eligible for participation in the study.
2. Patients clinically diagnosed as androgenetic alopecia (according to Hamilton grading scale Grade III vertex-V)
3. Patients who did not take any kind of treatment for male androgenetic alopecia for the past 1 month.
4. Patient willing to take daily oral medication and regular follow up.
5. Patients who have given the informed consent about the procedure.

Exclusion Criteria:

1. Patients with a history of cardiovascular and renal disorder.
2. Patients on topical therapy for male androgenetic alopecia.
3. Patients with active infection at the local site.
4. Patients with a history of hair transplant.

Pre-Procedure Workup:

Patients underwent comprehensive baseline assessments including complete blood count (RBC, WBC, platelets), serum electrolytes (sodium, potassium, chloride), renal function tests (creatinine, BUN), liver function tests (enzymes, proteins, bilirubin), and blood pressure monitoring to detect hypotension. Additionally, random blood sugar levels were checked, and cardiovascular status was evaluated with ECG. Chest X-rays were performed to rule out any pulmonary or vascular complications before starting treatment.

RESULTS:

The study observed progressive hair growth in most participants, with the average hair growth increased by 13.15% at 12 weeks of treatment (from 184.7 to 209 hairs/cm²) and by 20.30% at 28 weeks of treatment. Photographic assessment showed a 98% increase in hair growth at the vertex and a 100% increase in the frontal area. Complications included hypertrichosis (12%), orthostatic hypotension (1%), pedal oedema (2%) and others like itchy rash, urticaria.

DISCUSSION:

Minoxidil is widely used to treat androgenetic alopecia (AGA) by promoting hair regrowth, although its exact mechanism remains partly unclear. It stimulates hair follicles to enter and prolong the anagen (growth) phase while shortening the telogen (resting) phase, resulting in synchronized hair cycling. Low-dose oral minoxidil (OM) has been used safely for decades, especially in Asian populations, showing efficacy in both male and female pattern hair loss.

Our study demonstrated significant hair density improvements in male AGA patients, with a 13.15% increase at 12 weeks and 20.30% at 28 weeks. Younger patients (under 41 years) responded better, likely due

to shorter hair loss duration and less advanced AGA stages. Photographic assessments confirmed substantial hair regrowth, especially in the vertex region.

Common side effects included hypertrichosis and pedal edema, which were generally mild and manageable. Orthostatic hypotension was rare and minimized by dosing at night. Cardiovascular effects were minimal in healthy individuals, but caution is advised for elderly patients or those with severe hypertension or cardiovascular risks.

Overall, oral minoxidil offers an effective, convenient, and well-tolerated alternative to topical treatments, with favorable safety and efficacy profiles for healthy adults with AGA

CONCLUSION:

Oral minoxidil at a dose of 5 mg once daily significantly enhanced hair growth in a dose-dependent manner in men with AGA, as observed in our study during follow-ups at 4, 12, 24, and 28 weeks of treatment. This medication is widely available in 5 mg tablet, cost-effective, and is generally considered safe for healthy individuals, with minor side effects such as hypertrichosis and pedal edema. However, the use of oral minoxidil in individuals with old age or having severe hypertension or a risk of cardiovascular events should be approached with caution and careful planning

REFERENCES

1. Sinclair RD. Disorders of hair. In: Burns T, Breathnach S, Cox N, Griffiths C, editors. Rook's Textbook of Dermatology. 8th ed., Vol. 4. UK: Blackwell Publishing Ltd.; p. 66.1-66.31.
2. McElwee KJ, Shapiro JS. Promising therapies for treating and/or preventing androgenic alopecia. *Skin Therapy Lett.* 2012;17:1-4.
3. Alfonso M, Richter Appelt H, Tosti A, Viera MS, García M. The psychosocial impact of hair loss among men: A multinational European study. *Curr Med Res Opin.* 2005;21:1829-36.